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THE CAUSAL RELATION BETWEEN MIND AND BODY

I

ALL readers of this JOURNAL will recall William James's description of the diverse "Worlds of Reality" in his larger "Psychology,"[1] and will remember that he refers in some detail to seven such worlds: the worlds (1) of sense, or of physical "things" as we instinctively apprehend them; (2) of science, or of physical things as the learned conceive them; (3) of ideal relations; (4) of "idols of the tribe"; (5) of the supernatural; (6) of individual opinion; (7) of madness. "Every object we think of," he tells us, "gets at last referred to one world or another of this or some other list." To the "worlds" in his list, I would add the important "worlds"; (8) of immediate experience as introspectively recalled; and (9) of "reflection upon this immediate introspective experience"; as well as (10) the "world of dreamland"; and (11) the "make-believe world of imaginative discourse."

In this manner of thought it is apparent that James was not dealing with the concept of reality, but rather with the appreciation of realness, or presentative stability, upon which this concept of reality is based; and for this reason I have suggested[2] that we gain a better idea of his meaning if we speak of diverse "realms of realness" instead of "worlds of reality" as he did; for the significance of the point he made lies in the fact that given mental items, or presentations, may be included in more than one of these realms, "the whole distinction of real and unreal," as he says,[3] "the whole psychology of belief, disbelief, and doubt" being "grounded on two mental facts;—first, that we are liable to think differently of the same" (mental items); "and secondly, that when we have done so, we can choose which way of thinking to adhere to and which to disregard."

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[1] Vol. II., pages 291 ff.

[2] "Consciousness," pages 231 ff.

[3] *Op. cit.*, page 290.

In other words these diverse realms of realness are in fact diverse noetic systems in which certain specific mental items appear, and are of such a nature that what we call "the same" mental items may appear in several systems, and may be real in one system while very unreal in another.

That these worlds are as diverse as James teaches is not always evident. To be sure it becomes apparent that his statements are justified when, for instance, we compare the "world of dreamland," or the "world of imaginative make-believe," with the "world of sense" of every-day waking experience: or when we compare this latter world of every-day experience with what James called "the world of ideal relations, or abstract truths believed or believable by all": or again, when we compare this "world of sense" with that of "immediate experience as introspectively recalled," or with that of "reflection upon this immediate introspective experience." But it is not so evident that a significant diversity exists between the "world of sense, or of physical things as we instinctively apprehend them," and the "world of science, or of physical things as the learned conceive them." In fact these two "worlds" do not seem to the average scientist to be separate worlds at all; and even when, led by such suggestions as that given by James, he begins to consider them as diverse, he is likely to think of the "world of science" merely as a purer form of the "world of sense."

That the diversity of these two worlds is thus overlooked is accounted for, as we shall presently see, by the fact that there is a very special bond between the two. Nevertheless if we study their natures with care we soon become convinced that they are justly judged to be as diverse as any of the other worlds above referred to.[4]

[4] The diversity between the "world of science" and the "world of sense, or of physical things as we instinctively apprehend them," is clearly seen when we consider the concept of mechanism in the form in which it is generally accepted in our day, and which dominates our "world of science."

This concept of mechanism is evidently one that is based primarily upon the study of motions of inorganic bodies and has become established because it serves our purpose in coordinating many situations observable in the material world in which we live; and in maintaining it in relation to the inorganic world we choose to overlook many of the characteristics observable in these natural bodies and their relations as they are given in the "world of sense."

For instance, because it serves our purpose in taking this view, we choose to assume the existence of an ethereal medium, and agree to overlook the fundamental contradictions involved in the very nature of this medium as conceived, as well as the fact that its characteristics transcend, and are even incompatible with, experiences that are familiar to us in our observation of the "world of sense." In like manner we choose to overlook the difficulties connected with the conception of potential energy and with the distinction between kinetic and

II

As James says, the whole distinction of real and unreal is grounded upon the fact that these diverse "worlds" exist; that what we call "the same" mental items may appear in two or more different "worlds"; and that these mental items may be very real in one "world" while very unreal in another. The ether which is very real in the "mechanistic world" of the physicist is quite unreal in the "world of sense," if judged by the canons of every-day experience. The rising of the sun is very real in the "world of sense," but very unreal in the astronomer's "world of science." Certain items, and the relations between them, appear fully real in our "dreamland world," and in the "make-believe world" of the constructive imagination, which would be cast aside instantly as unreal in the world of every-day experience.

Such being the case, it seems clear that we can not properly draw conclusions in one "world" from premises in a diverse world; nor employ concepts derived from data given in one "world" within a quite diverse "world," without logical danger.

potential energy, which latter can not be said to be more than a name devised to describe the absence of all signs of energy. Again we choose to overlook the problems relating to the basis of the transformation of energy from potential to kinetic forms, and *vice versa,* as well as the more fundamental problems arising when we attempt to account for the existence of diverse forms of energy, and look for the basis of the transfer from one form to another. Beyond this we overlook the difficulties connected with the assumption of a closed energetic system, as well as those connected with the assumption of a beginning of the conditions that have led to present situations.

All these are difficulties and inconsistencies overlooked when we build up the quite artificial "world of mechanism" as a mode of interpretation of the phenomena observed in the inorganic world. When we turn to the study of organic life we again note motion followed by motion, and are again tempted to take a mechanistic view. But a new difficulty arises here in the fact that vital energy appears diverse from all other forms of energy. Even if this vital energy is finally shown to be resolvable into the forms found in the inorganic world, which have given rise to the mechanistic conception, the same problems above referred to in considering that conception must be overlooked if we are to make the conception work, and a new one in connection with the attempt to account for the basis of the rise of the vital energy form. In organic life, moreover, we find a new formidable difficulty in the existence of the capacity of inheritance; but especially of the capacity of variation involved in the development of one form from another, which, as Stout says, is as important a fact as inheritance.

All this shows that we are dealing with a very artificially restricted conception when we picture the universe in terms of energy, or of motion followed by motion. In other words, we are choosing to dwell, for the time being, not in the "world" of every-day experience, but in what, from the standpoint of this every-day experience, is a "make-believe world," just as much as the imaginative "world" of "Alice in Wonderland" and the "world" of the shadow pantomime are "make-believe worlds."

When we witness a shadow pantomime we live for the time being in a "world" where real situations do not correspond with real situations in the "world of every-day experience," and we should not for a moment think ourselves warranted in concluding, because the shadow girl allows the shadow man to kiss her, that the physical-object girl would permit such a liberty. Or taking a more serious case, we may note how impossible it is to make proper conclusions in the "world of introspective observation" from premises in the "metaphysical world." In the latter, pain and error may be looked upon as unreal by the absolutist, while "the same" pain and error in the "world of introspective experience" can not be held to be unreal. The error of the Christian Scientist lies in the fact that, half grasping the absolutist doctrine in a "metaphysical world," he jumps therefrom to conclusions in the "world of introspective experience."

Inasmuch as the concepts developed in any one "world" are based upon the appreciation of relations that are found real in that "world," I think it will be granted also that concepts which are developed in any one special "world" can not be transferred to, and made applicable within, a diverse "world" without risk of confusion of thought. As I shall attempt to show in the sequel, we take just such a dangerous step when we attempt to apply the concept of causality to the relation between mind and body.

III

It seems to me clear, notwithstanding the views of eminent thinkers to which I refer below, that the concept of causality arises primarily in connection with our naïve observation of natural phenomena; that it is, in other words, a concept belonging primarily to the "world of sense." One object strikes another that is stationary; the latter then moves; the former loses its motion in whole or in part. The motion of the first object is thought of as bound up with, and the basis of, the motion of the second. The experience of an innumerable number of facts of this nature leads to the development of the concept of cause.

From the "world of sense" develops the "world of science" and within it the "world of mechanism"; and although this newly found "world" is, as we have seen, diverse from the "world of sense," nevertheless in it the same order of occurrences appears which originally yielded the concept of cause. And in this "world of mechanism" this causal concept becomes of very fundamental importance. In the "world of sense" attention is given to many other than causal relations, which latter are only occasionally noted. The "world of mechanism," on the other hand, excludes all forms of experience to which it is impossible to apply this causal concept, a fact which becomes more and more significant as the structure of science becomes more complex. The causal concept thus serves as a most powerful bond between the "world of sense" and the "world of mechanism," and the "world of science" in general; and its importance is thus greatly emphasized.

It is to be noted that, whether applied in the "world of sense" or in the "world of science," this causal concept arises in connection with what we call our objective view of experience.

When we turn to what we call the subjective view of experience, we enter, as we have seen, a "world" quite diverse from the "world of sense" and equally diverse from the "world of science"—enter, in other words, the "world of immediate experience as recalled," from which develops the "world of reflection upon this immediate experience."

In these new "worlds" we should naturally expect to note the development of certain concepts quite diverse from those developed in the "worlds" of sense and of science, and this expectation we find realized.

In the "world of reflection upon immediate experience," which we describe as the field of introspective observation, we discover volitional experiences which yield a concept which we may speak of as the concept of efficiency.

This efficiency concept is clearly not derived from data found in the "worlds" of sense or science, within which the primal concept of cause appears. Nevertheless, when we objectify the whole situation we note that the experience of efficiency often occurs together with motions of our bodies, which in turn move objects just as they are moved in the world of physical objects. Hence this concept, which I here call efficiency, becomes closely bound up with the causal concept, and, as we shall presently see, is not uncommonly thought to be of its very essence—so much so indeed that the term causation is very frequently used as though it were identical with the term efficiency.

Using the term efficiency thus, and because of the observed relation above noted, we are led to make a false step, carrying the concept of efficiency, which properly belongs only to the world of introspective observation, over into the diverse world of physical objects, and conceiving of efficiency as part and parcel of causation in the physical world. Thus by a failure to keep clearly before us the diversity of the objective and subjective "worlds" we come to attach the term causality to the experience of efficiency, on the one hand,

and, on the other hand, come to think of this experience of efficiency as of the very essence of the causal concept.

To take such a position as is thus outlined may seem somewhat audacious, when it is considered how many keen thinkers have upheld the doctrine that, but for the sense of efficiency correlated with successive movements, we would never have conceived of any such thing as a cause. Thus Dr. James Ward tells us[5] that "the source and primary meaning" of cause is found "unquestionably in ourselves as active and efficient."

Nevertheless I must be bold in the assertion that this view appears to me to be untenable; for if I read experience aright, we are perfectly capable of entertaining the conception of cause in nature without attaching to it any attribute of efficiency whatever. For instance, I do not find this sense of efficiency bound up with my notion of the causal relation between the activities within the sun and the conditions of motion upon the earth. It is only as we approach realms closely allied with those which are distinctly related to the direct activities of man himself that the sense of efficiency becomes bound up with the notion of cause by the process above referred to; and surely, if we examine the evidence critically, we find in our experience of nature no evidence whatever of what we call efficiency when we speak in terms of immediate experience.

The distinction between these two concepts of cause and efficiency stands out more distinctly when we consider that the causal concept as derived from the observation of nature, and quite apart from the concept of efficiency, depends for its existence, as Hume taught us, upon the appreciation of what, when clearly defined, appear, as J. S. Mill puts it, as "ideas of invariable, certain, and unconditional sequence."

On the other hand, so far as I can see, the concept of efficiency *in the world of introspective observation* is not resolvable into "ideas of invariable, certain, and unconditional sequence."

It is of course a matter of fact that we do in every-day conversation speak of mental states as the cause of physical states, and *vice versa*. But we must note that we all very commonly apply the concept of cause where we have no right whatever to do so. The average man is restive when he finds it difficult to account for any situation that baffles him, but at once rests satisfied if he can attribute it to anything that he can call a cause. It has been said that the inhabitants of the Bahama Islands believe the Gulf Stream does everything but milk their cows. The other day the laundress of one of my friends, having been spoken to sympathetically of the fog on a "washing day," remarked with satisfied complacency "How can you expect anything else when everybody tries to dry their clothes on the same day?"

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[5] "The Realm of Ends," page 273.

It is true that we should not apply the concept of cause to the relation of mind and body did we not find some measure of similarity between the experiences involved and the causal succession in nature, and we may grant with Hume that so far as we apply the concept of causation to the relation of mind to body we do so as the result of judgments based upon the experience of successions. But this is quite apart from the point I would here make. What I am concerned to argue is that the concept of efficiency is derived from data given wholly in the mental field as immediately experienced, in which we gain none of the characteristics from which the concept of physical causation is developed.

It is true, as Hume argued, that when we consider ourselves as active, as doing something, and think of our volitions as causes of bodily movements, we are dealing with mere successions,—successions which must be judged to be invariable and unconditional if we are to justify ourselves in speaking of the volitions as the causes of the bodily acts. But I submit that when we think thus of this "sense of doing something," we objectify the whole situation. We think of our "sense of doing something" as "out there," exactly as if it were the "sense of doing something" thought of as belonging to another man in the objective world, rather than within our own introspective experience. And we then carry over into this objectified mental field the causal concept derived from the "world of sense."

This is natural enough when one considers our reckless attribution of cause above referred to, and is a common procedure in the careless life of the average man, and of the philosopher when he lays aside the attitude of the thinker and becomes an average man. The trouble arises however when the philosopher, as a thinker, assumes that he is justified, not only in carrying over the causal concept into this objectified mental field, but also in carrying it over into the non-objectified field of immediate experience. It is one thing to apply the term cause where we note mere physical-mental or mental-physical sequences, following the habit of the common man who thoughtlessly applies the causal relation whenever he notes sequences. It is quite another thing to show the warrant for this application of the causal concept, if we agree that it can only properly be applied when sequences are recognized to be "invariable, certain, and unconditional."

If the position thus taken is warranted, then clearly, when we ask whether the mind can act causally upon body, or body act causally upon mind, we must use care in distinguishing the diverse meanings attributed to the word causation.

Activities of body when considered *quite objectively,* as may be done in our study of the behavior of animals without any assumption of consciousness due to our observation of the analogy between them and ourselves, appear as part of the mechanistic system, within the "world of science." Here, causation, in the sense of invariable unconditional succession, may be held to apply. But the concept of efficiency does not at all clearly apply: for, if we strictly maintain the objective attitude we have no evidence whatever of the existence of mind in connection with this objective study of behavior.

When, on the other hand, we consider changes in consciousness as such, we find that the concept of efficiency does apply, while the concept of causation in the sense of unconditional invariableness of succession does not at all evidently apply.

It must be constantly borne in mind also that when we consider this question we are not dwelling within the "world of physical objects" which gives us the conception of causality as invariable unconditional sequence, nor within the "world of introspective experience" which gives us the concept of efficiency, but in a realm of realness quite diverse from both. Thus, in applying the concept of causality to the mental and physical items in this new "world," we are attempting to carry over into it a concept derived from the one or the other of the diverse worlds first mentioned. The question is whether we have any right to take this step—a question which can not fail to be raised if one bears in mind the radical difference above noted between the meaning attributed to causation in the realm of body and in the realm of mind.

IV

In taking up the consideration of this question we must note in the first place that it is necessary to avoid an obvious error made by the average man, who is wont to think that the mind sometimes acts causally upon the body and that sometimes the body acts causally upon the mind. We seem bound to reject any such haphazard and dubious relation, and to ask two questions; viz., first, whether we are warranted in holding that the mind always or sometimes acts causally upon the body, and, secondly, whether the body sometimes or always acts causally upon the mind. And we are also called upon to consider each of these questions in relation with the two concepts above considered, viz., that of causation proper derived from our objective observation of the world of objects, and that of efficiency derived from our reflection upon introspective experience which is held by many to be of the essence of the causal concept.

Let us take up first the concept of causation as it is thought of by those who hold that it is derived from our experience of efficiency. If under this view we hold that a bodily state is in any case the cause of a mental change, we are compelled to assume in physical nature the existence of an efficiency of which we have no evidence whatever.

If, on the other hand, we hold in any case that a mental state causes a bodily act, we hold that the bodily act was due to the efficiency component of the mental state. It is difficult, however, to bring such a tenet into harmony with the phenomena of habit, where we note that acts, which are at first preceded by mental states which involve this sense of efficiency, if repeated, soon follow the occurrence of mental states which do not involve this sense of efficiency, and are finally performed without the occurrence of any recognizable, antecedent, correlated mental states whatever.

If now we take the term causation in the sense applicable to our observations of the external world, we can apply it to the relation between mind and body only by showing that we have reason to believe that certain special mental changes follow invariably and unconditionally certain special physical changes; or that certain special physical changes follow invariably and unconditionally certain special mental changes.

We do note certain mental changes which in repeated instances appear to follow certain changes of bodily activities; but we surely are not warranted in saying that these sequences are invariable and unconditional. The cutting of superficial nerves is often in our experience followed by a marked painful sensation; but that this succession is not invariable or unconditional appears clear when we note that the soldier in the heat of battle often fails to appreciate the fact that he has received a superficial wound; this being an example of the influence of what we call a change of "threshold" of awareness.

In like manner we do note certain bodily changes which in repeated instances appear to follow certain mental changes; but we surely are not warranted in saying that these sequences are invariable and unconditional. Grief is so often followed by ill-health that we carelessly speak of the former as the cause of the latter, but the sequence is really not invariable or unconditional. Volitional experience does not always prevail to overthrow, or even to modify, habitual activities.

Surely then, whether we hold that mind acts on body, or body on mind, we are bound to agree that it is impossible to hold that the succession of changes is unconditional even where it appears to be invariable. Under such conditions, in the "world of sense," and, its development, the "world of science," from which the concept of causation here considered is derived, we are led, not to the attribution of a direct causal relation between the two successive phenomena, but to the postulation of a causal influence beyond both; as the invariability of the sequence of night and day are appreciated to be conditioned by something in nature extrinsic to them. We may in the end find ourselves compelled to postulate some cause as the determinant of the observed relation of correspondence between mental and physical changes, but this does not imply that we are forced to apply the causal concept to the mental-physical relation itself.

It may be remarked in passing that if we deny ourselves the luxury of occasional leaps from the realm of introspective observation into the realm of physical objects, which is the "world of reality" of every-day life, or *vice versa,* and if we persistently cling strictly to the realm of introspective observation, then nerve activities, and all other objects in the outer world, appear as complex systematized psychic systems, or as complex emphases within consciousness, fundamentally of the same nature as those spoken of as distinctly mental. In such a view the neururgic-noetic correspondence appears as a correspondence quite within consciousness, and presents a problem quite diverse from that to which the concept of causality applies.

V

Assuming that the validity of the application of the concept of causality to the relation between mind and body is open to grave question, nevertheless as it is, in fact, thus applied by the average man, we should not be surprised, after what has been said above, to find that he comes to look upon this causal relation as a thoroughly haphazard and lawless one, although we may well wonder that thinkers do not protest against such inconsistency. Few of us indeed can claim to be free from such a charge. We are usually quite content to say that sometimes the mind acts upon the body and sometimes it does not; and, on the other hand, that sometimes the body acts upon the mind and sometimes it does not. We say for instance that indigestion, which is a physical state, gives my friend "the blues," which is a mental state; but we do not seem to think that any physical state causes such a mental state as an act of will. We say that a noise, which is a mental state, makes our friend jump, the jumping being clearly a change of physical state; but we do not seem to think that any antecedent mental state causes the winking of his eyelids, or the throbbing of his heart, which are also physical states.

But this difficulty disappears altogether if we look away from this causal relation and concentrate our attention upon the correspondence between mental and body changes; for then we find much evidence that there is a thorough-going correspondence between successions of neururgic and noetic changes which enables us to account for the relation of mind·and body in a manner freed from the acceptance of haphazardness and lawlessness.

Under such a view certain changes in the nature of the activities within the nervous system are held to be coincident with the appearance of certain specific mental items. There thus appears to be a correspondence between neururgic and noetic forms, and evidence of the breadth of this correspondence increases as our knowledge of nerve activity increases. Furthermore, if we assume that the correspondence is thoroughgoing in the individual, we are enabled to correlate many phenomena in mental fields, such correlation being suggested by noticeable correlations in neururgic fields. This theory of thoroughgoing correspondence being thus corroborated, if carried to what appear to be its legitimate conclusions, indicates, first, that there is psychic existence wherever there is life; and finally, that to all transfer of energy some psychic change corresponds.[6]

Now what we have to deal with in connection with this theory is merely corresponding successions in both the neururgic and the noetic series, and, if we approach our problem from this standpoint, we find the interpretation of the facts concerning the relation of mind to body, which are usually made in terms of causation, thoroughly well interpretable without any such use of this causal concept, provided we accept the view that there is a psychic field of non-awareness, a view in favor of which we have much cogent evidence.

In closing, then, let us consider a few cases to illustrate how the apparent haphazardness and lawlessness of the relation between mind and body disappear if we interpret this relation in terms of correspondence rather than in terms of causation.

If I were to walk up behind a man and discharge a pistol close to his ear he would jump aside suddenly and would be likely to describe the occurrence by saying "the noise made me jump." The noise is a psychic state, while the jump is due to certain active muscular states occasioned by changes in the nervous system. His description therefore implies that the psychic state (the noise) in some mysterious way caused the physical change (the jump).

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[6] This I call the theory of neururgic and noetic correspondence to differentiate it from the theory of parallelism which was devised by the atomistic psychologists, and which fails in many directions. The theory of correspondence, however, so far as I can see, meets these difficulties in assuming that changes in a psychic *system* correspond with changes in the physical *system* as differentiated in the nerve system.

But if we consider the case merely as an instance of coordinate successive occurrence the mystery seems at once to disappear. The psychic change, which we call the noise, was accompanied by a change of nerve condition, and in like manner the jump, which was due to certain nerve activities, was accompanied by certain "instinct feelings" quite within the mental order. What happened may therefore be formulated as follows:

Mental series	(A) Noise,	followed by (B) "instinct-feeling."
Corresponding physical series ...	(X) Nerve change,	followed by (Y) jump.

But in his description of this occurrence the average man overlooks the nerve change X and also the instinct-feeling B, so that he thinks of the jump as due to the noise rather than to the overlooked nerve change X. When the situation is stated in the terms above used this occurrence surely seems quite natural and not especially involved in mystery.

Or let us take another commonplace case. The ordinary man is likely to say of one of his friends "His deep grief (mental state) made him ill (nerve situation)."

If the occurrence thus described is formulated as above we have:

Mental series	(A) Grief,	followed by (B) a mental state (overlooked).
Corresponding physical series	(X) Nerve situation (overlooked),	followed by (Y) illness.

In his description of this occurrence the ordinary man overlooks the nerve change X and also the psychic change B, so that he thinks of the illness as due to the grief rather than to the depressed nerve condition accompanying this grief.

So again you may hear some one say "My act of will (mental state) made my arm move (physical state)." But if we state this in terms of a similar formulation we have:

Mental series	(A) Will-act	followed by (B) a mental state (overlooked).
Corresponding physical series	(X) Nerve change (overlooked),	followed by (Y) arm movement.

In the ordinary description of this occurrence the nerve change (X) corresponding with the will-act (A) is overlooked as is also the psychic change (B) corresponding with the arm movement (Y), so that the arm movement is thought of as due to the appreciated will-act rather than to the nerve condition that accompanied this will-act.

The commonplace remark about willing to move one's arm is closely allied with similar remarks made by a very large number of people in these days whom you are accustomed to hear say "I willed to be cured and I am now well"; or in other words "my will-act (mental) gave me good health (physical)."

If this is formulated as above it reads as follows:

Mental series	(A) Will-act,	followed by (B) mental conditions (overlooked).
Corresponding physical series ...	(X) Nerve changes (overlooked),	followed by (Y) good health.

In the ordinary description of this occurrence the nerve change (X) corresponding with the will-act (A) and also the mental state (B) corresponding with good health (Y) are overlooked, so that the restored health is thought of as due to the will-act rather than to the resultants of the nerve changes corresponding with this will-act.

The same people who tell us that they regain their health by will power are likely to say: "By an act of will I can make pain disappear." If the occurrences upon which they base such a broad statement are formulated as above, we have:

Mental series	(A) Will-act,	followed by (B) loss of pain.
Corresponding physical series	(X) Nerve change (overlooked),	followed by (Y) nerve change (overlooked).

Here the nerve changes that accompany both the act of will and the loss of pain are overlooked, so that the person who speaks thus is *aware of* merely (A) the will-act (mental) followed by (B) loss of pain (mental).

It is true that in some cases the will-act is followed by disappearance of pain; which merely means that the nerve situation accompanying a particular will-act is followed by special nerve conditions whose psychic correspondents involve no pain. We have, however, no evidence to warrant us in holding that the sequence is invariable and unconditional, and that therefore the causal concept is applicable. In other words we have no adequate evidence to warrant us in holding that the nerve state accompanying the will-act is in all cases followed by the healthy physical state which carries with it this loss of pain. That is to say, the experience above described gives us no ground for the belief that if a man has sufficient "will power" he can always remove the unhealthy conditions which yield pain.

HENRY RUTGERS MARSHALL.

NEW YORK CITY.

LITERARY SYNESTHESIA

READING the literature of synesthesia one is frequently impressed by the poetical value of many of the sense-analogies reported. It would seem that this aspect of the topic has been particularly interesting to the French investigators of the subject, so that, in conjunction with the more strictly scientific reports of such cases, they have given us an exposition of them from the standpoint of musical and literary criticism. French poets have themselves manifested their interest in synesthetic experiences and have not hesitated to utilize such material in enhancing poetic expression. One recalls Max Nordau's unhesitating condemnation of the attempt to confound sense-qualities and his inevitable conclusion that such exchange of adjectives is only a fantastic straining after novelty of effect, or, if rooted in actual experience, a confession of degeneracy.

Psychologically, the attempt to treat together cases of true synesthesia, in which sensations of a given sensory quality regularly and uniformly arouse sensations of another sensory tone, and cases of so-called colored thinking or the employment of sense-analogies in a figurative or reflective way, has induced some confusion. Each of these topics is undeniably interesting and may be related to the other in ways not yet thought of, but at present each demands separate treatment.

We may then legitimately ask (1) to what extent true synesthesia is to be found among poets, recognizing this question as distinct from that which asks (2) the esthetic value of an exchange of sense-qualities and the extent to which such transfer is employed by imaginative writers. The objection may, however, be raised that, apart from a personal examination of a given poet, it would be impossible to answer the first question, for in appeal for answer to the poet's works we can not with certainty distinguish between spontaneous and deliberate analogies. The objection is undoubtedly well taken. None the less, the attempt to answer the question allures one. It seems scarcely possible, for instance, that a poet, who experienced a sys-